

Natural Resources Conservation and Energy Element

EXECUTIVE SUMMARY

Natural Resources Conservation and Energy element addresses five topics: flooding, erosion, preservation of vegetation, wildlife protection, and the conservation of energy while encouraging the greater use of renewable energy resources.

Flooding protection: protect people and property from the threat and damage of flooding.

Erosion protection: eliminate or minimize on-site or down slope erosion.

Vegetation protection: protect native plants from extinction and use them to preserve the character of the Sonoran desert.

Wildlife protection: maintain large, intact patches of native vegetation to protect wildlife habitat and take steps to protect wildlife corridors.

Energy: provide for the efficient use of energy while at the same time encouraging the greater use of renewable energy resources.

INTRODUCTION

Conservation is the act of preserving, guarding or protecting from loss, decay, injury or violation. Conservation goes hand in hand with sustainability, defined by the World Commission on Environment and Development as "meeting the needs of the present without compromising the ability of future generations to meet their own." In the 21 Century we must recognize the earth as a fragile system and ourselves as a part of that system. Conserving our natural resources - water, vegetation, and wildlife - has expanded to include concern with a deteriorating environment, be it energy, pollution, global warming, land productivity or the landscape itself. The urban form is the result of cheap energy, economic health, and technological advances, all of which can diminish the natural environment. The challenge in conservation is to link urbanization with the underlying natural systems. By doing so, we begin to work with the natural systems towards conserving our limited resources.

Arizona state law directs the Natural Resources Conservation element to address "conservation, development and utilization of natural resources, including forests, (deserts), soils, rivers and other waters, harbors, fisheries, wildlife, mineral and other natural resources." Further state law requires the Energy Element to identify policies that encourage and provide incentives for the efficient use of energy while assessing policies and practices that provide for greater uses of renewable energy sources. Protecting and conserving these resources that contribute to our quality of life is everyone's responsibility. The policies and recommendations of this plan are intended to ensure we retain our natural resources while allowing economic and environmental well-being for the community. The Water Resources element addresses water supply, water reclamation, water quality, and ground water. The Environmental Planning element addresses sustainability, air quality, energy efficiency, noise mitigation, pollution prevention and related topics.

GOAL 1 FLOODING PROTECTION: THE THREAT OF FLOODING FOR PEOPLE, PROPERTY, AND THE NATURAL ENVIRONMENT SHOULD BE MINIMIZED.

Every site potentially contributes to and has solutions for flood control and storm water quality management. The challenge is to achieve appropriate land use, whether or not the site is adjacent to stream channels or other water bodies. Every development needs to provide solutions for flood control and storm water management within its boundary, by using the existing drainage features in and adjacent to its site. The solutions can be site based, small, numerous and inexpensive and rely on maintenance practices instead of being regional, large, expensive and made of concrete.

Policies:

1. Separate, where feasible, storm water runoff from the sanitary sewer system and active irrigation ditches.
2. Provide drainage facilities in areas where the natural topography has been disturbed or cannot reasonably be restored to predevelopment conditions.
3. Support flood control planning and coordinate with other entities in that planning (e.g., Maricopa County Flood Control District, and U.S. Army Corps of Engineers).

Recommendations:

- A. Continue developing, planning and maintaining the storm water drainage system.
 - B. Work cooperatively with the Planning/Design Branch of the U.S. Army Corps of Engineers, to seek engineering solutions in our larger ephemeral wash systems (that run only in response to rain), which are more sensitive to the existing environment and provide a quality recreation space and habitat for flora and fauna. Comprehensively maintain existing washes to prevent excessive erosion.
 - C. Continue working with the Arizona Game and Fish Department, the Arizona Department of Water Resources, the Arizona Department of Environmental Quality, the U.S. Army Corp of Engineers, and other agencies whose mission is to preserve and protect riparian areas and water quality, in order to address shoreline stabilization and habitat restoration needs at municipal lakes and parks.
 - D. Study the impacts of new development in areas known to flood onto surrounding properties.
4. Cooperate with neighboring cities to solve mutual drainage problems.

Recommendation:

- A. Require developers to work with adjacent communities in their master planning to provide small, on-site solutions that reduce storm water flows off-site and minimize maintenance of storm water channels caused by silt from construction and impervious sites (that repel water and increase runoff) within developments.
5. Develop projects that control flooding while maintaining the larger hydrologic systems within our urban environment.

Recommendation:

- A. Work with Arizona Flood Plain Managers (AFMA) in developing draft guidelines for future flood control projects.
6. Pursue funding for flood control projects.

Recommendation:

- A. Identify revenue sources for constructing a storm water drainage system that provides communitywide protection.
7. Develop ways to address management and maintenance needs in our urban desert washes.
8. Improve water quality, habitat preservation, and storm water management through compliance with the regulations of the Clean Water Act, Section 404.

Recommendations:

- A. Choose non-structural solutions to flood control problems that will provide storm water quality benefits and support the city's efforts to comply with the federal Clean Water Act, Section 404.
 - B. Continue information and resource outreach on the Clean Water Act, Section 404 through:
 - Distributing information to the public on the Clean Water Act, Section 404
 - Continuing training appropriate city staff in natural and cultural resource compliance
 - Continuing the city's 404 Program, through implementing the 404 policy, and coordinating with the 404 Project Team
9. Maximize on-site retention through Best Management Practices and minimize impermeable surfaces or separate impervious areas where possible, to allow storm water infiltration and decrease off-site flows. Impervious areas do not include paved streets.

Recommendations:

- A. Continue to require on-site water retention for new development.
 - B. Investigate creating a city code applying to parking lots and similar areas, which permits the use of alternative materials and paving practices that allow permeability and water recharge without adding to particulate levels.
 - C. Investigate parking lot standards specifically addressing permeability and storm water management for adoption into City Code.
10. Use landscape islands in paved areas to receive storm water and reduce the impact of impervious areas.

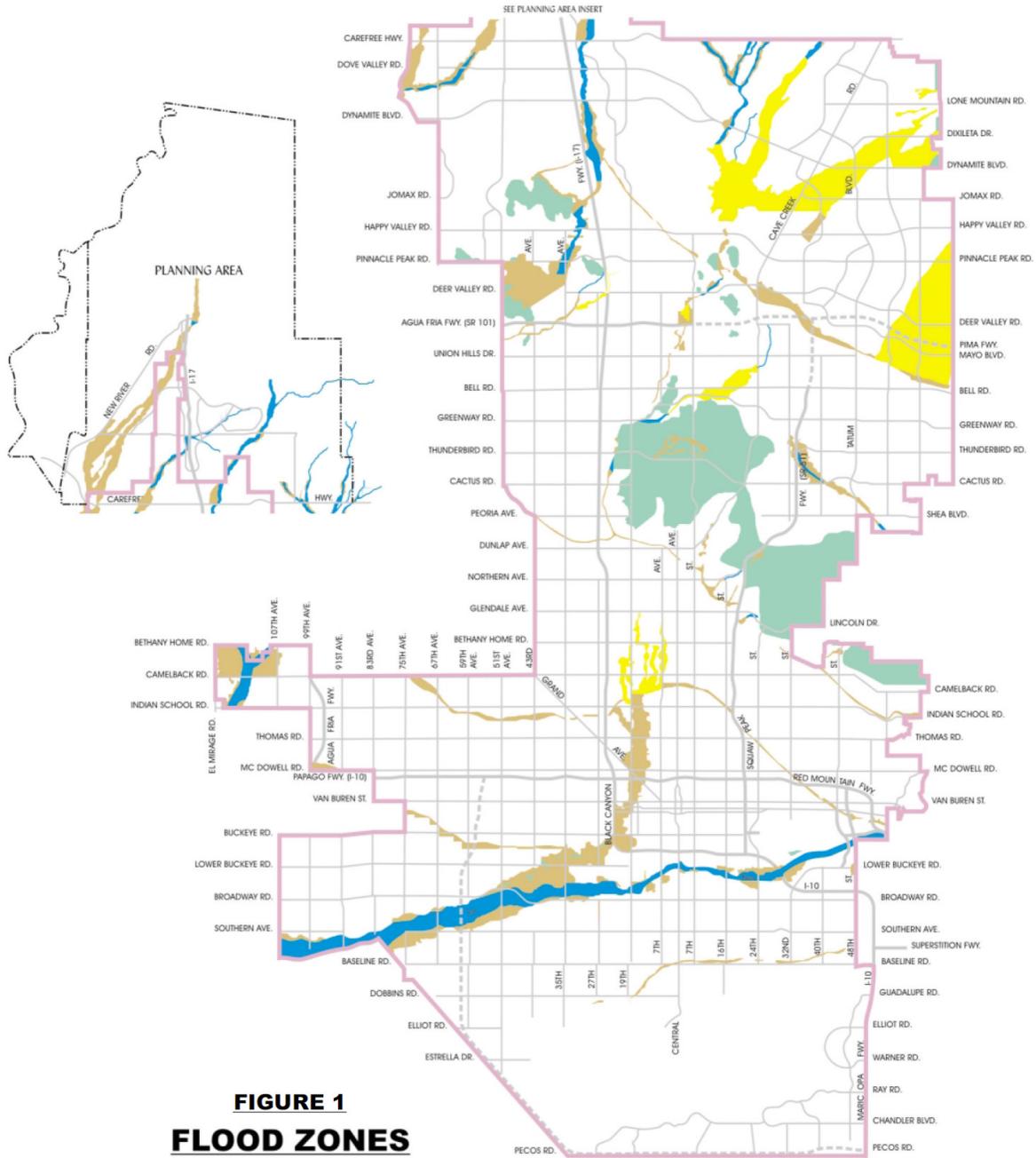


FIGURE 1
FLOOD ZONES

- AREAS OF 100 YEAR SHALLOW FLOODING, 1'- 3'
- AREAS OF 100 YEAR FLOOD
- FLOODWAY
- AREAS DETERMINED TO BE OUTSIDE THE 500 YEAR FLOOD
- AREAS BETWEEN LIMITS OF THE 100 YEAR FLOOD AND 500 YEAR FLOOD



11. Preserve and restore the natural systems of ephemeral desert washes to manage nonstructural storm water and control flooding where feasible.
12. Preserve the unimpeded flow of washes as part of a larger hydrologic system.

Recommendations:

- A. Limit the obstacles, crossings, and obstructions to all washes, both on-site and through a site, as part of a larger interconnected wash network.
- B. Coordinate with AFMA to develop nonstructural flood control solutions.

GOAL 2 EROSION PROTECTION: GRADING AND EROSION CONTROL PRACTICES, SEDIMENT CONTROL PRACTICES AND WATERWAY CROSSINGS SHOULD ELIMINATE OR REDUCE POTENTIAL ON SITE OR DOWN SLOPE EROSION.

The construction process and the removal of vegetation make soils vulnerable to wind and water erosion. Soil erosion endangers water resources by reducing water quality, and creates siltation, necessitating the repair of sewer and storm drains. Clearing and grading during construction also causes a loss of native vegetation and wildlife habitat.

Policies:

1. Minimize transportation of sediment from and through a site.

Recommendation:

- A. Review current city ordinance on grading to comply with new/current industry standards and technological advances.
2. Encourage the reduction of clearing and grading entire sites. Explore methods to preserve contiguous areas of natural vegetation such as those listed on the State of Arizona Native Plant Law threatened and endangered (T&E) list.
3. Use vegetation with native plant species as the principal method of erosion control.

Recommendation:

- A. Promote using vegetation instead of artificial means as a method of permanent erosion control.

GOAL 3 VEGETATION PROTECTION: VEGETATION SHOULD BE PROTECTED AND CONSERVED AS A MEANS OF PRESERVING THE DIVERSE CHARACTER OF LOCAL PLANT COMMUNITIES.

The Sonoran Desert contains some of the most unique natural landscapes in the world. Rugged mountains, modest slopes, and washes invite a complex intermingling of trees, shrubs, cacti, succulents and groundcover. In addition, the urbanized areas of Phoenix include a vegetative character that is very unique and in contrast to the Sonoran Desert. Plants help fulfill both the aesthetic and functional needs of our urban communities. A benefit of incorporating native

plants into the built landscape is that it can replace native vegetation removed in the development process.

In 1997, the State of Arizona passed the Arizona Native Plant Law, which prohibits or limits the salvaging of plants or parts of plants, including seeds or fruit, based on the threat of state or local extinction of that plant. The protected plants are separated into five categories: Highly Safeguarded, Salvage Restricted, Export Restricted, Salvage Assessed, and Harvest Restricted.

Highly safeguarded - native plants likely within the foreseeable future to become jeopardized or in danger of extinction throughout all or a significant portion of their ranges. This category includes those plants listed as endangered, threatened or category 1 in the Federal Endangered Species Act of 1973.

Salvage restricted - native plants requiring salvage permits, tags, and seals. Plants in this category have a high potential for damage by theft or vandalism.

Export restricted - native plants protected from over-depletion through interstate sale or shipment.

Salvage assessed - native plants requiring tags, seals and annual salvage permits that have a sufficient value to support the cost of salvage.

Harvest restricted - native plants restricted from excessive harvesting or overcutting because of the intrinsic value of their byproducts, fiber or woody parts.

There are numerous benefits to using native plants. Of particular interest to the city are:

- Using native plants to provide habitat, shelter, nesting areas and forage for wildlife.
- Using native plants to retain regional character.
- Using native plants in xeriscape gardening for the environmental benefits such as lower water use.

Policies:

1. Continue to uphold the State of Arizona Native Plant Law.

Recommendations:

- A. Identify sites that contain species on the Arizona Native Plant Law list, during the development review process.
 - B. Establish a volunteer work force to periodically remove nonnative plants from city property and privately owned property, with the owners' permission, in coordination with the appropriate governmental agency.
2. Promote re-vegetation using native plant species.

Recommendations:

- A. Promote the use of native plant species, especially those listed in the State of Arizona Native Plant Law as highly safeguarded and salvage-restricted.

- B. Promote replanting native trees versus exotic species in the event of mortality of existing vegetation, unless out of character with historic or predominant vegetation.
3. Develop criteria and map protected areas where vegetation removal is prohibited or should be limited.

Recommendations:

- A. Require as part of the rezoning process, when necessary, a landscape inventory and salvage plan for new development prior to issuing a grading and drainage permit, when the site contains species on the Arizona Native Plant Law list.
 - B. Retain, to the extent possible, all mature vegetation on site for those plants on the State of Arizona Native Plant Law list.
4. Continue to endorse area plans and design guidelines that promote using a plant list or plant pallet to promote a specific landscape character or quality.

Recommendations:

- A. Promote in all development the xeriscape landscape, which uses predominantly native Sonoran vegetation, as well as the fundamental principles of landscape design for greatest water efficiency.
- B. Promote relocating versus destroying non-mature native species on the State of Arizona Native Plant Law list.
- C. Promote preserving vegetation in the urban areas where the vegetative character of the area is established.

GOAL 4 WILDLIFE PROTECTION: LARGE INTACT PATCHES OF NATIVE VEGETATION SHOULD BE MAINTAINED TO PROTECT WILDLIFE HABITAT.

The Sonoran Desert is home to a wide variety of wildlife. The diversity of wildlife depends on a variety of components including structure, plant community and plant community evolution, landforms, soil, and climate and the stability of the landscape. The Saguaro cactus, an icon for the Sonoran Desert, exemplifies diversity: spiders, silverfish and moth larvae live in its pleats; bats pollinate its flowers, and birds and rodents eat its fruit. Woodpeckers, flickers, doves and red-tailed hawks nest in its arms and, over time, owls and martins move in. When a Saguaro is removed or destroyed, the entire natural hub of activity is also destroyed.

The built environment alters portions of the landscape and habitat areas permanently. Phoenixians seek out and enjoy the environment and its wildlife. Many area residents have come to expect encounters with a variety of wildlife supported by the desert preserves and surrounding landscape communities. Wildlife conservation, therefore, is an obligation to the community that must be carefully balanced and weighed against the need to accommodate future development.

Policies:

1. Prevent fragmentation of continuous areas of habitat, by maintaining large, intact areas of native vegetation and/or encourage planting of native vegetation in areas of new development.

Recommendations:

- A. Identify existing areas of natural vegetation and prioritize importance based on predetermined criteria, such as the presence of native vegetation, existing wildlife habitat, potential for wildlife habitat or threat of local extinction of a wildlife population.
 - B. Maintain existing isolated fragments of native habitat within the urban environment and develop wildlife corridors connecting the fragments or, in the case where the corridor remains, provide land management that will preserve the corridor in the future. Encourage the use of native plant materials in development, which can help provide connections to isolated fragments of habitat.
2. Limit land use, and intensity of use, around intact areas of native vegetation to those uses with the least impact.

Recommendations:

- A. Explore and strongly consider revising on the General Plan map, the adjacent land use for any critical habitat to reflect the land use most compatible with the continuance of that patch, such as a low intensity use verses a high-intensity use such as commercial or industrial.
 - B. Explore and strongly consider buffers of low-intensity use that surround areas of natural vegetation functioning as wildlife habitat.
3. Maintain connections among wildlife habitat.

Recommendation:

- A. Investigate processes, based on the biological characteristics of the specie or species involved, for preserving or developing wildlife corridors that connect areas of natural vegetation.
4. Identify and protect existing wildlife corridors, and identify and develop new corridors for wildlife movement.

Recommendation:

- A. Maintain pockets of open areas with connecting corridors where feasible. Dense clusters of development may be required for this. Work with private entities to allow for maintenance of open space and natural areas so that fire hazard situations do not develop.
5. Discourage all exotic species, especially those that are or have the potential for

invasiveness, for areas of special Sonoran Desert significance, such as areas adjacent or close to:

- Desert foothills and mountainous areas
- Desert preserves
- Streams and rivers, particularly the Rio Salado
- Desert wash areas
- Riparian zones
- Xeroriparian areas

Recommendation:

- A. Investigate funding to re-vegetate areas of important and significant habitat, such as desert foothills areas, from the inclusion of exotic species to replicate and replace native species.

- 6. Explore methods to preserve existing habitat and biotic communities.

Recommendation:

- A. Work with other agencies to educate the general public and development community on the importance of native vegetation and the reciprocal relationship to wildlife.

- 7. Segregate areas of higher impact recreational uses, such as mountain biking, from areas of wildlife habitat and conservation.

GOAL 5 ENERGY: THE WISE USE OF ENERGY SHOULD BE ENCOURAGED THROUGH EDUCATION, CONSERVATION, AND EFFICIENCY

Energy conservation is the act of reducing the consumption of energy while achieving or maintaining a similar outcome. Energy conservation allows us to mitigate numerous adverse environmental and social impacts of energy production and consumption, such as air pollution, loss of wilderness areas, foreign energy dependence, and others.

For decades, the city of Phoenix has recognized the importance of energy conservation. Since the late 1970's, the city has saved over \$75 million through various energy awareness and conservation programs including:

- Energy efficiency retrofits for air conditioning and lighting;
- Design standards for city buildings;
- Energy conservation outreach programs;
- An Interdepartmental Energy Management Task Force; and
- Water and wastewater treatment plant optimization.

Policies:

- 1. Continue to refine and improve the City of Phoenix Energy Conservation Program.

Recommendation:

- A. As new and more efficient energy saving methods become available, consider

incorporating these new methods into the city's Energy Conservation Program.

2. Strongly encourage the use of renewable fuels and energy efficient vehicles in the city's fleet.

Recommendations:

- A. Increase the purchase and use of energy-efficient vehicles in the city fleet.
 - B. Expand the use of ethanol, biodiesel and other renewable fuels in the city fleet and other equipment engines.
3. Reduce energy consumption through the city's Green Building Program by requiring a policy that all new city buildings are to be constructed to the basic (Leadership in Energy and Environmental Design) LEED standard including meeting the requirements of the more stringent energy standards in the city's Building Standards Manual.
 4. Maintain and enhance energy efficiency standards in the City Building Code.
 - A. Review and consider adoption of supplements to the 2006 International Energy Conservation Code currently included in the City Building Code.
 5. Continue to investigate and implement renewable energy projects including solar, wind, gas-to-energy and other renewable sources.

Recommendations:

- A. Implement the city's Renewable Energy Goal to achieve 15% of the city's energy use from renewable sources by 2025.
- B. Encourage renewable energy research, projects and businesses in the community.